

No. 672,130.

Patented Apr. 16, 1901.

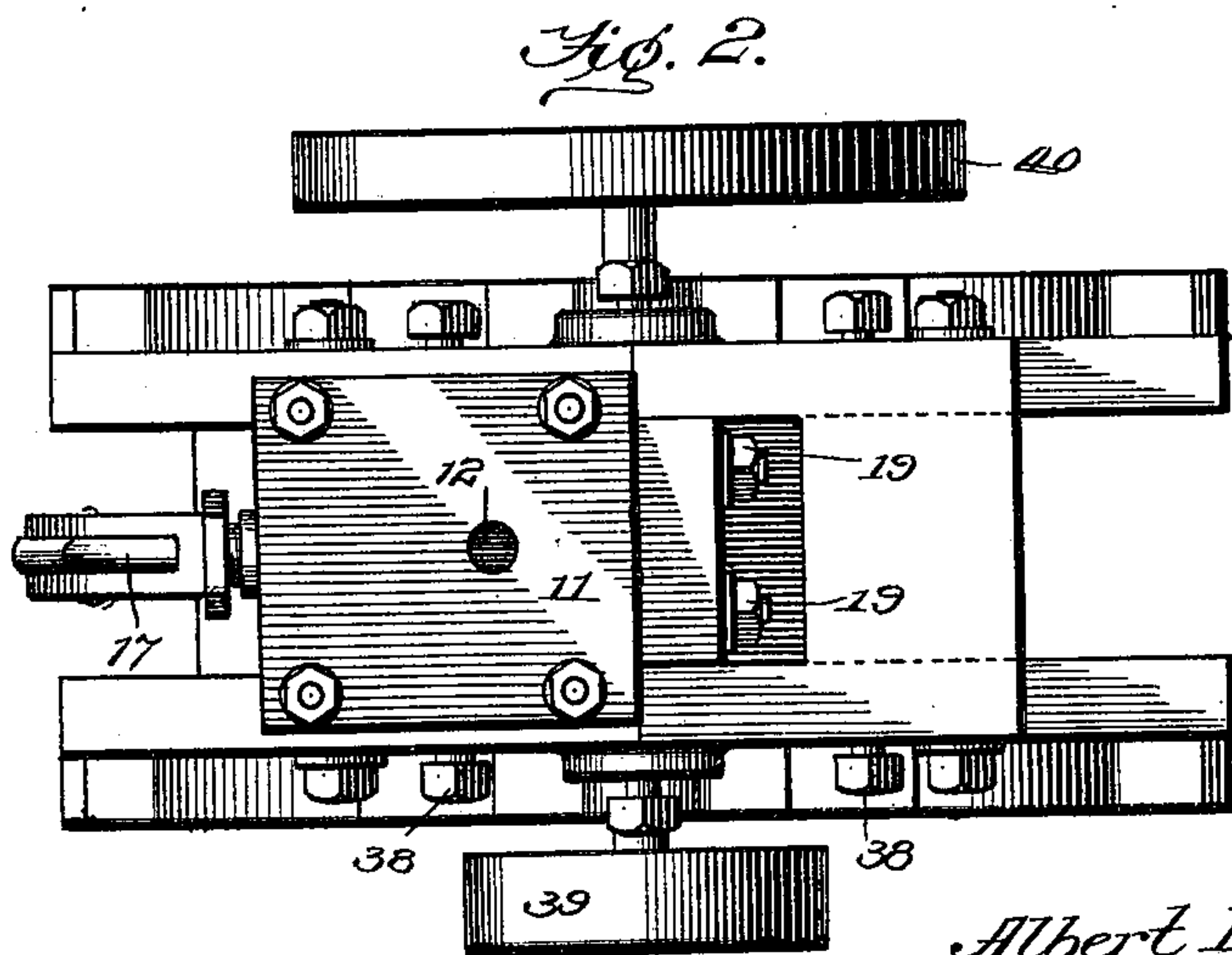
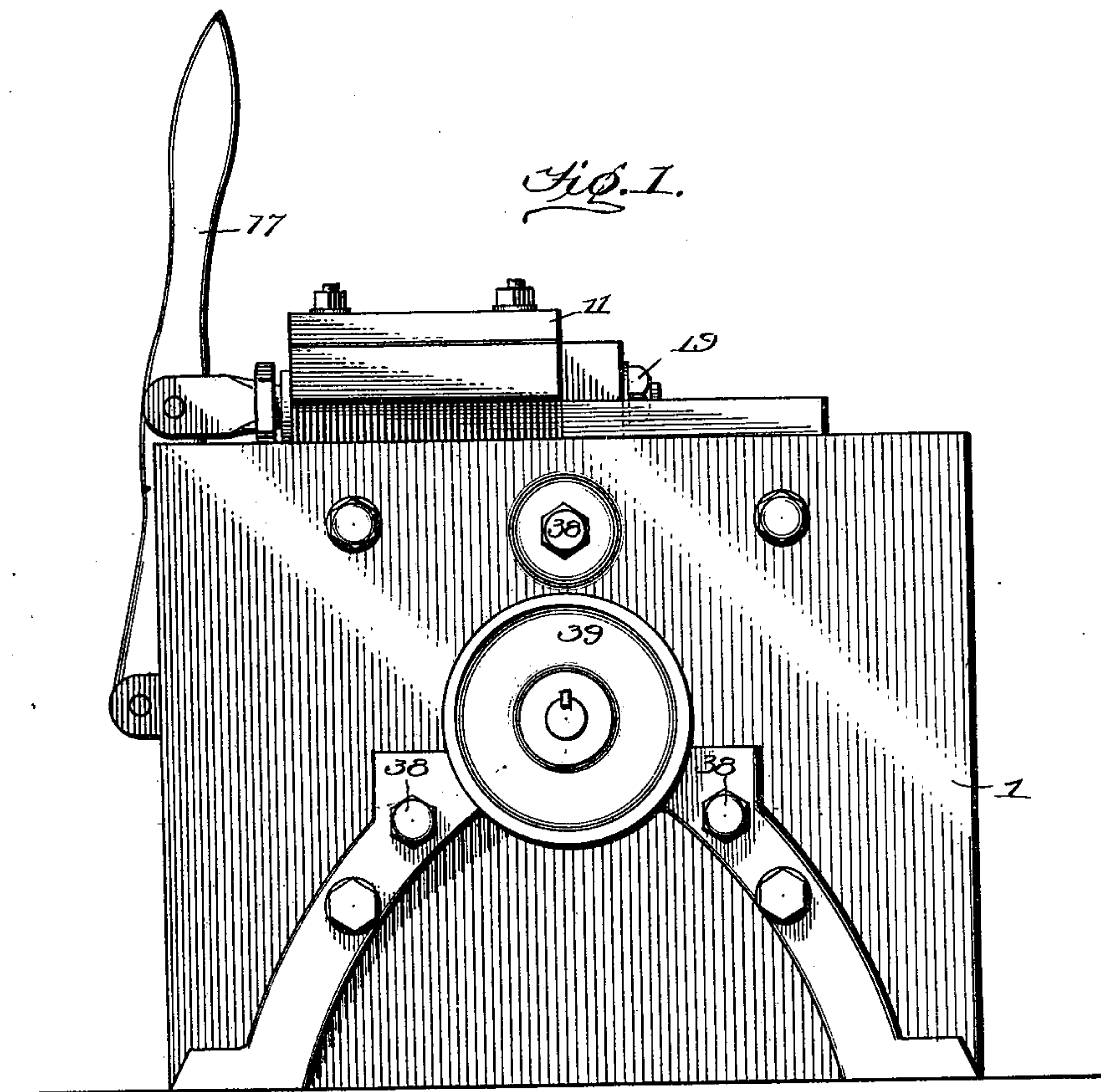
A. B. MELLICK & J. F. BONERTZ.

STEAM ENGINE.

(Application filed Sept. 26, 1900.)

(No Model.)

3 Sheets—Sheet 1.



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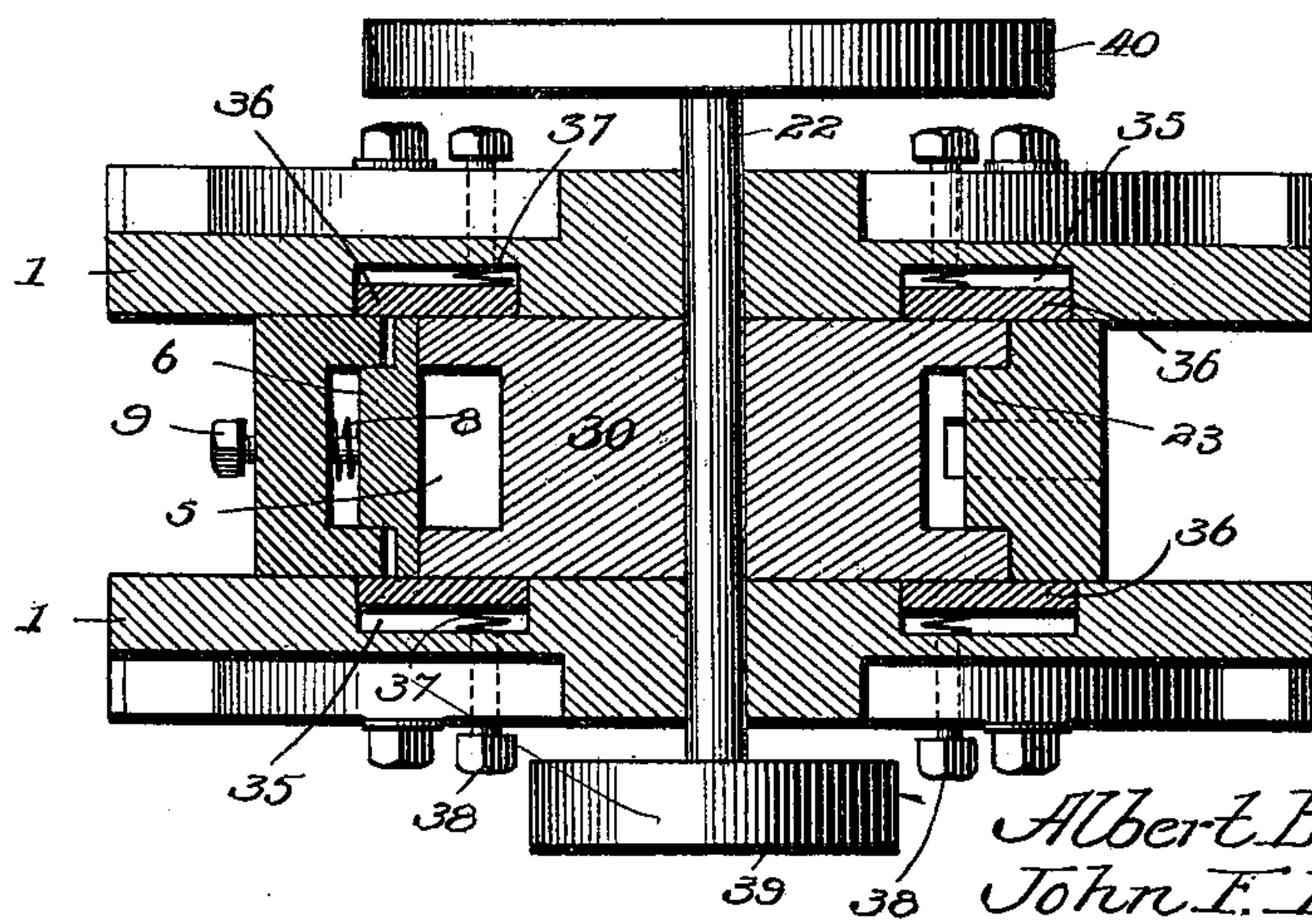
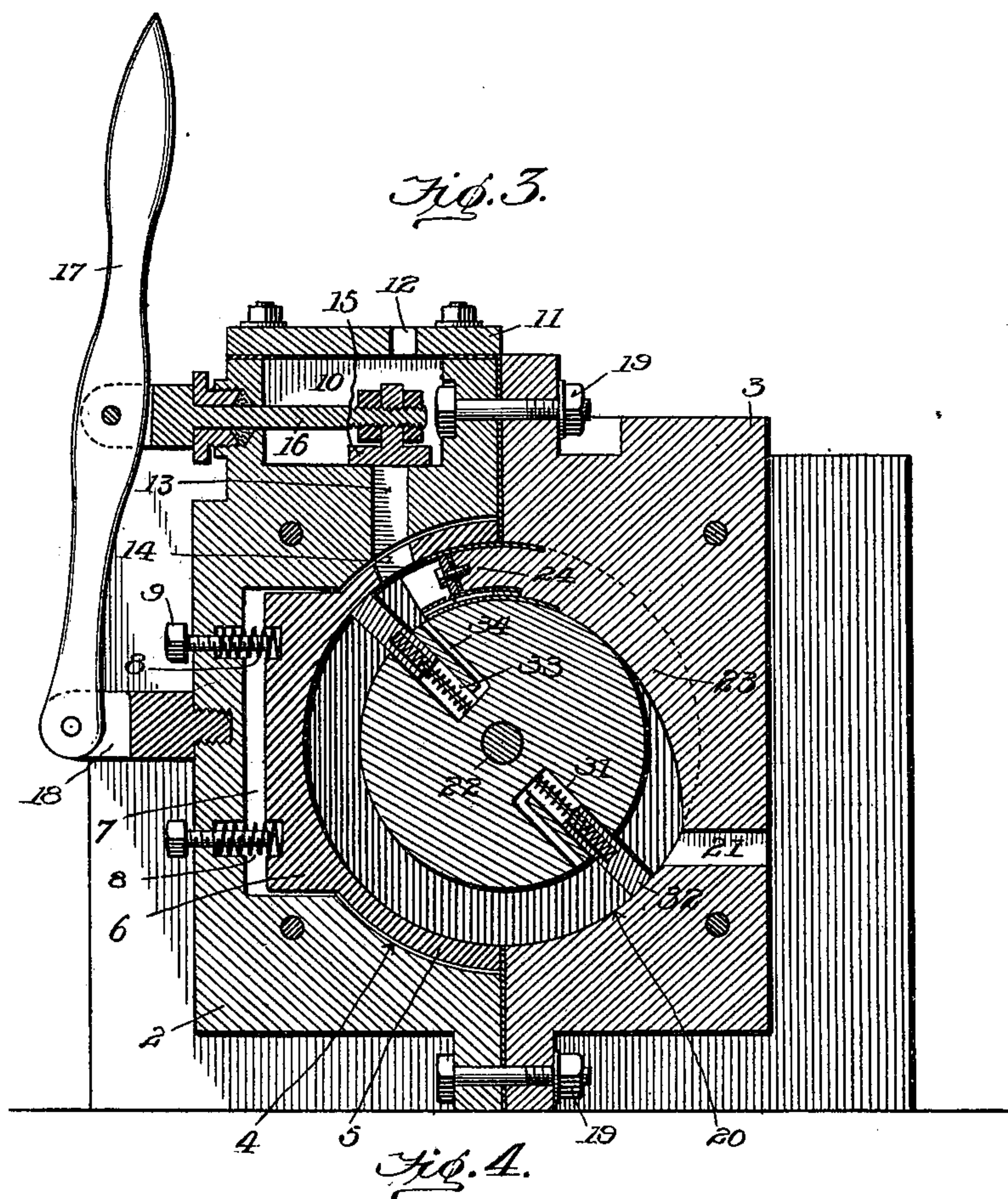
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3 Sheets—Sheet 2.



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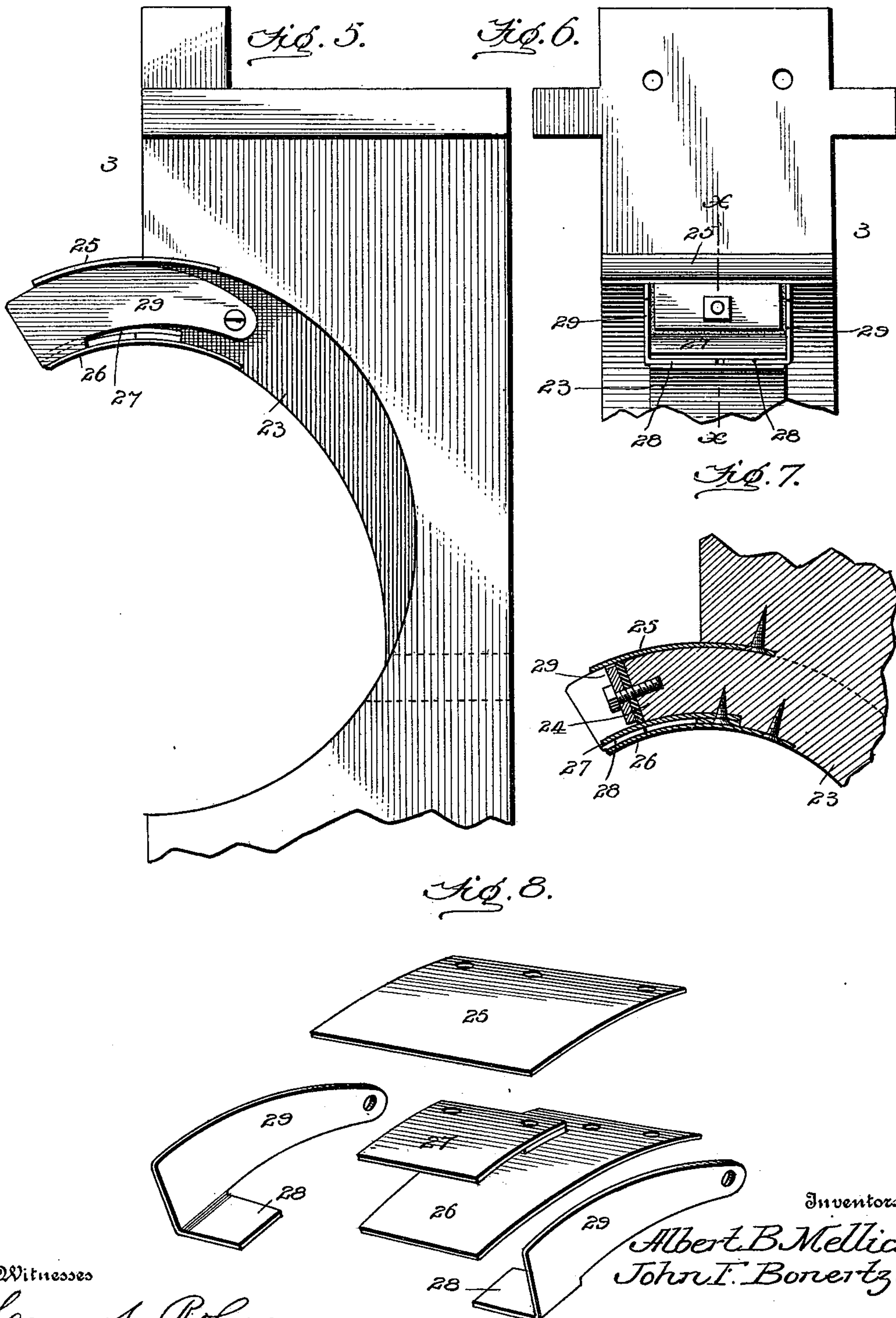
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3 Sheets—Sheet 3.



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UNITED STATES PATENT OFFICE.

ALBERT B. MELLICK AND JOHN F. BONERTZ, OF ST. HELENA, NEBRASKA.

STEAM-ENGINE.

SPECIFICATION forming part of Letters Patent No. 672,130, dated April 16, 1901.

Application filed September 26, 1900. Serial No. 31,186. (No model.)

To all whom it may concern:

Be it known that we, ALBERT B. MELLICK and JOHN F. BONERTZ, citizens of the United States, residing at St. Helena, in the county of Cedar and State of Nebraska, have invented new and useful Improvements in Steam-Engines, of which the following is a specification.

This invention relates to new and useful improvements in rotary engines; and its primary object is to provide a device which is smooth in operation and which is provided with a novel arrangement of inlet and outlet ports whereby dead-center is overcome.

A further object is to provide packing of peculiar construction and arrangement whereby the escape of steam from the casing and past the piston-heads is prevented, said packing being adapted to automatically take up all wear thereof.

To these ends the invention consists in providing a casing formed of two sections adapted to be bolted together and forming a substantially cylindrical compartment for the reception of a rotary piston having piston-heads slidably mounted in opposite sides thereof. These piston-heads are adapted to contact with the curved walls of the casing and means is provided within said casing for depressing the piston-heads successively after the same have passed the exhaust-port. Packing of peculiar arrangement is located within the casing and is of such construction as to prevent the backward escape of steam after the same has been discharged into the casing. Packing is arranged within one side of the casing and is adapted to bear automatically upon the ends of the piston-heads and compensate for all wear thereof.

The invention also consists in the further novel construction and combination of parts hereinafter more fully described and claimed, and illustrated in the accompanying drawings, which show the preferred form of our invention, and in which—

Figure 1 is a side elevation of the engine. Fig. 2 is a top plan view. Fig. 3 is a central vertical longitudinal section. Fig. 4 is a central horizontal section. Fig. 5 is a detail view of a portion of one of the sections of the casing, showing the spring-packing secured to the abutment. Fig. 6 is an end view thereof.

Fig. 7 is a section on line xx , Fig. 6; and Fig. 8 is a detail view of the packing of the abutment, showing the parts thereof separated.

Referring to the figures by numerals of reference, 1 1 designate the face-plates of the casing, which are bolted at opposite sides of sections 2 and 3 of the casing. One of these sections 2 is provided in its inner face with a substantially semicylindrical recess 4, which is adapted to receive a semicylindrical block 5, having a squared portion 6 arranged upon the outer face thereof, at the center, and adapted to extend into a similar recess 7, arranged at a point within the wall of the semicylindrical recess 5. This squared portion 6 is adapted to be contacted by coil-springs 8, which are mounted upon adjusting-screws 9, extending through the section 2 of the casing. The upper portion of section 2 of the casing is recessed at 10 to form a steam-chest, and a plate 11 is bolted over the recess 10 and has an aperture 12 therein through which the steam is admitted.

A passage 13 extends from the bottom of recess 10 and registers with an opening 14, which is formed within the semicylindrical block 5, before referred to. A sliding valve 15 is mounted upon the bottom of recess 10 and is connected by means of a rod 16 to a lever 17, which is pivoted at its lower end to a bracket 18, projecting from section 2 of the casing. The section 2 is adapted to be secured by means of bolts 19 or in any other suitable manner to the second section 3 of the casing. This section is provided in its inner surface with a substantially semicylindrical recess 20, which is equal in diameter to the internal diameter of the block 5.

An exhaust-pipe 21 is arranged within the section 3 of the casing at a point which is out of alinement with the inlet-port 13 and a shaft 22, which extends transversely through the center of the recess or compartment formed by the sections 2 and 3 of the casing. This section 3 of the casing is provided with an inclined abutment 23, which extends inward gradually from a point adjacent to the exhaust-port 21 to the inlet 13, at which point it terminates in a shoulder 24. As shown in Fig. 3, the larger end of the abutment extends into the section 2 of the casing, and se-

cured upon this end is a metal plate 25, which is adapted to bear upon the concave face of the block 5. A second plate 26 is secured to the concave surface of the abutment, and arranged thereunder is a plate 27, these two plates serving as guides for ears 28, which extend laterally from spring-plates 29, secured at their inner ends to the sides of the abutment, as shown.

Mounted upon the shaft 22, before referred to, is a cylindrical piston 30, having an annular groove therearound which is adapted to receive the abutment 23. Recesses 31 are formed within opposite sides of the piston for the reception of sliding piston-heads 32, which are held normally projected against the concave wall of the working chamber of the casing by means of coil-springs 33.

Steam-passages 34 extend from the surface of the piston to points adjacent to the inner ends of the recesses 31, before referred to, and these are for the purpose of admitting steam to said recesses, and thereby assist the springs 33 in projecting the piston-heads.

Each of the face-plates 11, before referred to, is provided in its inner face with a circular groove 35, which is adapted to receive a ring 36. This ring is held normally pressed upon the edge of the piston 30 and the casing by means of coil-springs 37, having screws 38 for adjusting the tension thereof. It will be seen that these rings 36 serve the purpose of packing and prevent the escape of steam from the working chamber within the casing.

It is of course obvious that the shaft 22 can be provided with a drive-wheel 29 and a fly-wheel 40, if desired; but the latter wheel is not necessary, as the piston will rotate continuously without employing the same.

Steam is admitted to the working chamber by sliding the valve 15 away from the passage 13. Steam will then pass through the aperture 14 and between the side spring-plates 29 and will force the piston-head 32, which is adjacent thereto, forward, carrying the piston therewith. Some steam will also pass into the recess 31 and assist the spring 33 in firmly clamping the piston-head upon the concave surface. As the piston revolves the piston-heads will come into contact with the abutment 23 successively and be forced inward; but prior to contacting therewith the steam in front of the heads will escape through the exhaust 21. As the piston-heads travel upon the abutment they will be forced inward until they reach the end of the spring-plate 26, when they will fly outward against the concave wall of the block 5, arriving in a position to receive the steam as the same is admitted through the inlet-port 14.

It will be seen that the steam admitted to the working chamber cannot pass over the piston toward the exhaust-port, as such movement will be prevented by the spring-plates 29 and 26, which bear firmly upon the walls of the groove within the piston. As before stated, the rings 36 will prevent the lateral es-

cape of steam from the working chamber. By providing a spring-depressed concavo-convex block 5 any wear that may occur upon the piston-heads will be automatically taken up.

In the foregoing description we have shown the preferred form of our invention; but we do not limit ourselves thereto, as we are aware that modifications may be made therein without departing from the spirit or sacrificing the advantages thereof, and we therefore reserve the right to make all such changes as fairly fall within the scope of our invention.

Having thus fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a rotary engine, the combination with a casing; of a recessed piston therein; sliding piston-heads arranged within the recesses; inlet and outlet ports to and from the casing at points out of alinement with the center of the piston; an inwardly-extending abutment within the casing extending from the exhaust to a point adjacent to the inlet; and spring-plates secured to the abutment at a point adjacent to the inlet.

2. In a rotary engine, the combination with a casing; of a piston therein having recesses in the opposite sides thereof; piston-heads slidably mounted within the recesses; inlet and outlet ports to and from the casing at a point out of alinement with the center of the piston; an abutment within the casing extending into an annular groove in the piston from the exhaust to a point adjacent to the inlet-port; and spring-plates secured to the abutment adjacent to the inlet-port adapted to bear upon the walls of the groove in the piston.

3. In a rotary engine, the combination with a casing; of a rotary piston therein having recesses in the opposite sides thereof; piston-heads slidably mounted within the recesses; a semicylindrical block within the casing adapted to bear upon the piston and its heads; means for holding said block normally in contact with the piston; inlet and outlet ports to and from the casing and out of alinement with the center of the piston; an abutment within the casing extending into an annular groove in the piston from the exhaust to the inlet port; spring-plates secured to the abutment at a point adjacent to the inlet and adapted to contact with the walls of the groove in the piston.

4. In a rotary engine, the combination with a casing; of a rotary piston therein, having recesses in the opposite sides thereof; a semicylindrical block within the casing adapted to bear upon the piston; means for holding the block normally in contact with the piston; piston-heads within the recesses of the piston; means for holding the heads normally projected; inlet and outlet ports to and from the casing and out of alinement with the center of the piston; an abutment extending into an annular groove in the piston from the exhaust to the inlet port; spring-plates extending from the abutment at opposite sides there-

of and of the inlet-port, and adapted to contact with the side walls of the groove in the piston; and a spring-plate secured between said side plates and adapted to contact with the bottom of said groove.

5 5. In a rotary engine, the combination of a casing formed with oppositely-arranged sections secured together; a face-plate at opposite sides of the casing and having circular grooves therein; normally-projected rings within the grooves; a rotary piston within the casing, said piston and casing adapted to be contacted by the rings; piston-heads slidably mounted within opposite sides of the piston; 10 a semicylindrical block within the casing; means for holding said block normally in contact with the piston; inlet and outlet ports to

and from the casing and out of alinement with the center of the piston; an abutment extending into an annular groove in the piston from the exhaust to the inlet port; spring-plates secured to the abutment and extending under and to each side of the inlet, said plates adapted to bear upon the walls of the groove within the piston; and means for regulating the supply of steam to the inlet-port. 20 25

In testimony whereof we affix our signatures in presence of two witnesses.

ALBERT B. MELLICK.
JOHN F. BONERTZ.

Witnesses:

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P. C. NISSEN.